NOISE ELEMENT

RICHMOND GENERAL PLAN

October 1975

NOISE ELEMENT

RICHMOND GENERAL PLAN

RICHMOND, CALIFORNIA
ADOPTED OCTOBER 14, 1975

RESOLUTION NO. 170-75

RESOLUTION OF THE COUNCIL OF THE CITY OF RICHMOND ADOPTING THE "NOISE ELEMENT OF THE RICHMOND GENERAL PLAN" DATED SEPTEMBER 1975

WHEREAS, Section 65302 of the California Government Code requires that the City of Richmond's General Plan include a Noise Element as follows:

> "(g) A noise element in quantitative, numerical terms, showing contours of present and projected noise levels associated with all existing and proposed major transportation elements. These include, but are not limited to the following:
>
> (1) Highways and freeways,
> (2) Ground rapid transit systems,
> (3) Ground facilities associated with all airports operating under a permit from the State Department of Aeronautics.
>
> These noise contours may be expressed in any standard acoustical scale which includes both the magnitude of noise and frequency of its occurrence. The recommended scale is sound level A, as measured with A-weighting network of a standard sound level meter, with corrections added for the time duration per event and the total number of events per 24-hour period.
>
> Noise contours shall be shown in minimum increments of five decibels and shall be continued down to 65 db(A). For regions involving hospitals, rest homes, long-term medical or mental care, or outdoor recreational areas, the contours shall be continued down to 45 db(A).
>
> Conclusions regarding appropriate site or route selection alternatives or noise impact upon compatible land uses shall be included in the general plan.
>
> The state, local, or private agency responsible for the construction or maintenance of such transportation facilities shall provide to the local agency producing the general plan, a statement of the present and projected noise levels of the facility, and any information which was used in the development of such levels."

and

WHEREAS, the Richmond City Planning Department has prepared a "Noise Element of the Richmond General Plan" dated September 1975 in conformity with said Section 65302(g); and

WHEREAS, a Final Environmental Impact Report has been prepared for said element and certified by the Environmental Impact Panel and the Planning Commission and City Council have reviewed and considered the information contained in said report; and

WHEREAS, Section 65352 of the Government Code of the State of California requires that the Planning Commission approve, by resolution, all elements which are to become a part of the General Plan; and

WHEREAS, the Planning Commission did, on September 18, 1975, by resolution, approve the document entitled "Noise Element of the Richmond General Plan" dated September, 1975 as the Noise Element of the Richmond General Plan required by Section 65302 of the Government Code of the State of California.

NOW, THEREFORE, BE IT RESOLVED that the Council of the City of Richmond does hereby adopt the document entitled "Noise Element of the Richmond General Plan" dated September, 1975 as the Noise Element of the Richmond General Plan required by Section 65302 of the Government Code of the State of California.

BE IT FURTHER RESOLVED that the City Council directs that the City Clerk keep on file a copy of said Element, and that the Planning Department maintain a copy of said Element for public inspection.

BE IT FURTHER RESOLVED that the City Council does hereby amend the Richmond General Plan by adopting said new Noise Element of the Richmond General Plan which replaces and supersedes the findings and policy statements presently contained in the Coastline Plan (Part V of Section c: Environmental Resource Management, V. Noise, pp. 109-119) and further amends and supersedes the General Plan by revising other inconsistent sections of the General Plan as appropriate.

I certify that the foregoing resolution was passed and adopted by the Council of the City of Richmond at a regular meeting thereof held October 14, 1975, by the following vote:

Ayes: Councilmen Silva, Bates, Grydyk, Corcoran, Campbell and Fernandez.

Noes: None.

Absent: Councilmen Allen, Nelson and Wagerman.

Harlan J. Heydon
Clerk of the City of Richmond

APPROVED:

Mayor

Certified as a True Copy

Harlan J. Heydon
CLERK OF THE CITY OF RICHMOND, CALIF

Approved as to form:

William M. Bonnell
Deputy City Attorney

RESOLUTION NO. 75-2

RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF RICHMOND APPROVING THE "NOISE ELEMENT OF THE RICHMOND GENERAL PLAN" DATED SEPTEMBER, 1975

WHEREAS, Section 65302 of the California Government Code requires that the City of Richmond's General Plan include a Noise Element as follows:

> "(g) A noise element in quantitative, numerical terms, showing contours of present and projected noise levels associated with all existing and proposed major transportation elements. These include, but are not limited to the following:
>
> (1) Highways and freeways,
> (2) Ground rapid transit systems,
> (3) Ground facilities associated with all airports operating under a permit from the State Department of Aeronautics.
>
> These noise contours may be expressed in any standard acoustical scale which includes both the magnitude of noise and frequency of its occurrence. The recommended scale is sound level A, as measured with A-weighting network of a standard sound level meter, with corrections added for the time duration per event and the total number of events per 24-hour period.
>
> Noise contours shall be shown in minimum increments of five decibels and shall be continued down to 65 db(a). For regions involving hospitals, rest homes, long-term medical or mental care, or outdoor recreational areas, the contours shall be continued down to 45 db(a)..
>
> Conclusions regarding appropriate site or route selection alternatives or noise impact upon compatible land uses shall be included in the gener l plan.
>
> The state, local, or private agency responsible for the construction or maintenance of such transportation facilities shall provide to the local agency producing the general plan, a statement of the present and projected noise levels of the facility, and any information which was used in the development of such levels."

and

WHEREAS, the Richmond City Planning Department has prepared a "Noise Element of the Richmond General Plan" dated September, 1975, in conformity with said Section 65302(g); and

WHEREAS, a Final Environmental Impact Report has been prepared for said element and certified by the Environmental Impact Panel and the Planning Commission has reviewed and considered the information contained in said report; and

WHEREAS, Section 65352 of the Government Code of the State of California requires that the Planning Commission approve, by resolution, all elements which are to become a part of the General Plan;

NOW, THEREFORE, BE IT RESOLVED that the Planning Commission of the City of Richmond does hereby approve the document entitled "Noise Element of the Richmond General Plan" dated September, 1975 as the Noise Element of the Richmond General Plan required by Section 65302 of the Government Code of the State of California.

BE IT FURTHER RESOLVED that the Planning Commission recommends to the City Council the adoption of said document as the Noise Element of the Richmond General Plan.

BE IT FURTHER RESOLVED that the Planning Commission recommends to the City Council that the Richmond General Plan be amended by adopting said new Noise Element of the Richmond General Plan which replaces and supersedes the findings and policy statements presently contained in the Coastline Plan (Part V of Section c: Environmental Resource Management, V. Noise, pp. 109-119) and further amends and supersedes the General Plan by revising other inconsistent sections of the General Plan, as appropriate.

- - - - - -

I certify that the foregoing resolution was passed and adopted by the Planning Commission of the City of Richmond at a regular meeting thereof held September 18, 1975, by the following vote:

Ayes: Commissioners Greco, Allyn, Lobese, Modie, Miller, Harris & Vukelich

Noes: None

Absent: Commissioners Griffin and Pitts

Gary D. Pitts
Secretary

Approved:

Chairman

Approved as to form:

Deputy City Attorney

TABLE OF CONTENTS

		PAGE
I.	**INTRODUCTION**	1
	A. Legal Requirement	1
	B. Scope of the Noise Element	1
	C. Primary Objectives	2
	D. Relationship To Other Plan Elements	2
	E. Description Of The Planning Area	2
II.	**FINDINGS**	3
	A. Defining the Noise Problem	
	1. Characteristics of Sound	
	2. The Effects of Noise on People	
	3. Noise Level Standards for Land Use	
	B. Present and Projected Noise Contours	7
	1. Major Arterials	
	2. BART	
	3. Railroad Operations	
	4. Aircraft Operations	
	C. Identification of Noise Impacted Areas	13
	1. Residential Areas Subject to Excessive Noise Levels	
	2. Noise Impacts on Specific Land Uses	
III.	**POLICIES**	15
	Goal 1: Reduce Transportation Related Noise	15
	Goal 2: Minimize Noise Generation & Impacts	16
	Goal 3: Minimize Noise Impacts of New Transportation Facilities	18

MAPS

	FOLLOWING PAGE:
Map 1: Transportation Facilities in the Richmond Planning Area for which Noise Contours have been Developed	8
Map 2: Existing Noise Contours and Impact Areas for Major Arterials (1974)	9
Map 3: Projected Noise Contours and Impact Areas for Major Arterials (1995)	9
Map 4: Existing Noise Contours for BART (1974)	9
Map 5: Projected Noise Contours for BART (1995)	9
Map 6: Existing and Projected Noise Contours for Railroad Operations (1974 and 1995)	10
Map 7: Existing and Projected Noise Contours for Aircraft Operations (1974 and 1995)	12
Map 8: Areas Subject to Excessive Transportation Noise Levels	13

TABLES

Table 1: Typical Noise Levels	3
Table 2: Summary of Noise Levels Identified as Requisite to Protect Public Health and Welfare Within Adequate Margin of Safety	6
Table 3: Land Use Compatibility Chart for Community Noise	7

I. INTRODUCTION

A. Legal Requirement

This Noise Element has been prepared pursuant to Section 65302(g) of the California Government Code which requires cities and counties to develop a Noise Element as part of their General Plan.

As required by the State, the Noise Element focuses on the primary generators of noise in the Richmond Planning Area -- major transportation facilities. There are, of course, significant sources of noise other than transportation operations, such as construction equipment, emergency vehicles, barking dogs, city maintenance operations, etc. However, in Richmond, as in most other modern cities, the movement of goods and people is by far the single most pervasive source of noise.

B. Scope of the Noise Element

Specifically, the following transportation facilities were identified as major noise sources within the Richmond Planning Area:

-- Interstate 80, Hoffman Boulevard;
-- Major Arterials;
-- BART;
-- The Atchison-Topeka and Santa Fe Railroad and the Southern Pacific Railroad; and
-- Heliports.

Noise contours were developed based on existing traffic volumes and volumes estimated for 1995 to indicate the noise levels generated by these facilities and to ascertain which areas of the City are subject to high noise levels. Using this information as a basis, policies were developed to achieve the following basic goals:

1. Reduce transportation-related noise;

2. Minimize noise generations and impacts; and

3. Minimize noise impacts of new transportation facilities.

C. Primary Objectives of the Noise Element

The primary objectives of the Noise Element are to identify areas of the Richmond Planning Area subject to excessive or annoying transportation noises and to establish mechanisms to minimize, to the greatest extent possible, excessive noise impacts.

D. Relationship to Other Plan Elements

The Noise Element is most closely related to the circulation and land use elements of the Richmond General Plan. It updates and supersedes the earlier Noise Element which had been included in the Coastline Plan adopted by the City Council in 1973. The earlier element only evaluated major transportation noise generators within the Coastline Area boundaries. This Noise Element, which includes appropriate findings and policies from the earlier element, evaluates major transportation noise generators for the entire Richmond Planning Area.[1]

E. Description of the Planning Area

The Richmond Planning Area includes the cities of Richmond, San Pablo and El Cerrito as well as certain unincorporated County areas, including North Richmond, El Sobrante, Rollingwood, East Richmond Heights, Kensington and a portion of the Richmond Annex. The Element applies to all the land within the Planning Area to the extent that Richmond has jurisdiction or recognized obligations to make recommendations.

[1] Some of the policies adopted in the Noise Element of the Coastline Plan have been found to be unenforceable or inappropriate at this time. These policies have not been incorporated into this Element.

II. FINDINGS

A. Defining the Noise Problem

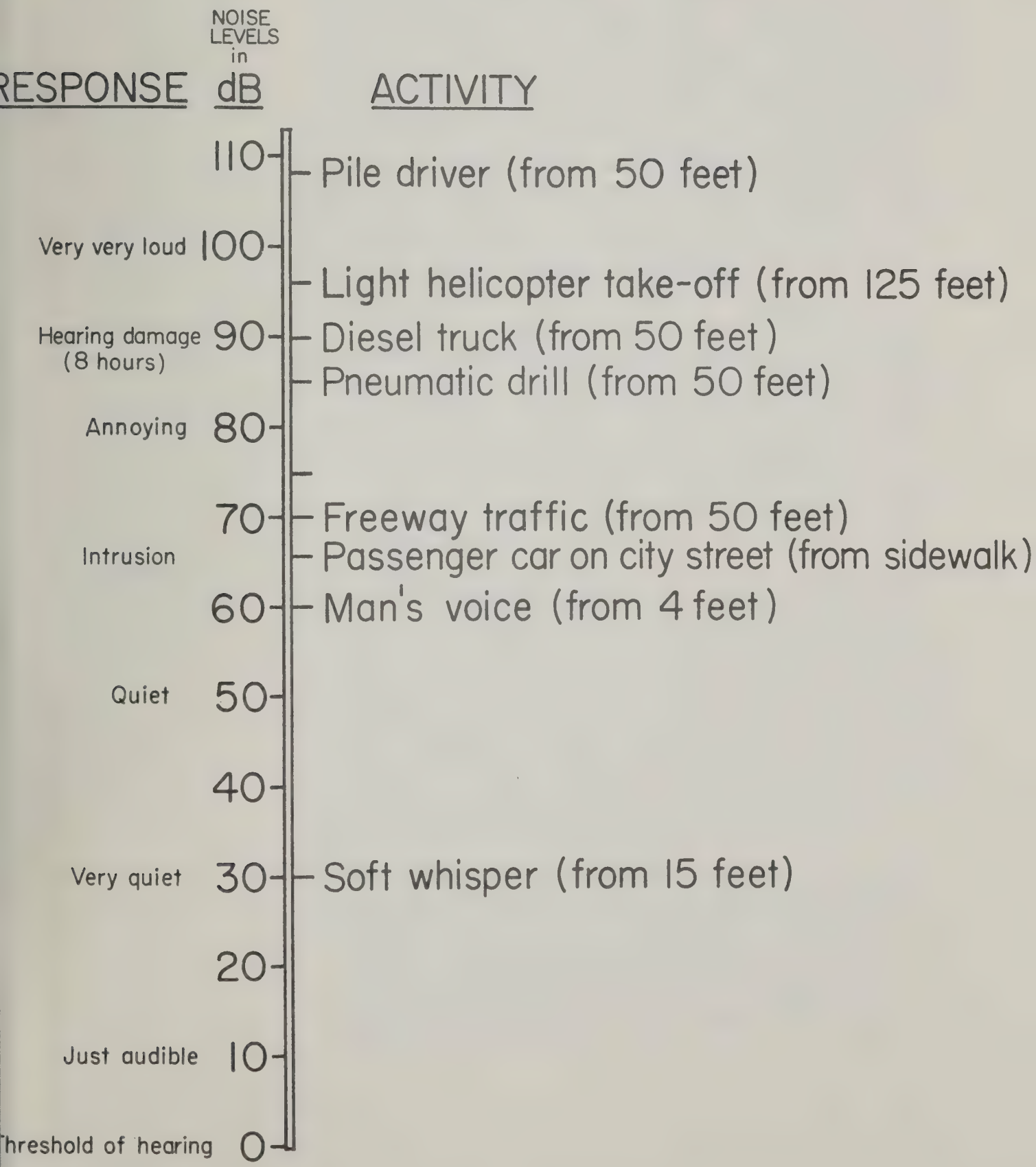
Noise is a subjective evaluation which can be broadly defined as unwanted and unhealthy sound. Loudness is usually regarded as the prime ingredient, but there are also other characteristics which contribute to noise and its effects. These include frequency of pitch, duration, masking noises in the environment and the sound's familiarity.

1. Characteristics of Sound. Sound is measured in terms of four parameters:

   (i) Intensity or volume is the amount of sound pressure or energy put forth at the source and is measured in decibels (dB). The decibel scale ranges from 0 to 140, with 0 corresponding to the lowest sound level that a healthy, unimpaired human ear can detect. This scale is logarithmic, thus for each increase of 10 decibels the sound increases 10 times in intensity. However, the relative loudness of sounds, as perceived by the human ear, does not closely match the actual relative amounts of sound energy. A listener will tend to judge a 10 dB increase in the sound level as only twice as loud, even though it represents a 10 fold increase. Table 1 indicates typical noise volumes for various activities.

   (ii) Frequency or pitch, the "highness" or "lowness" of a sound, is measured in cycles per second or Hertz (Hz). Although some pure tone sounds contain only one frequency, sound more usually is a mixture of different frequencies. The human ear can identify sounds with frequencies as low as 10 Hz to as high as 20,000 Hz. However, it does not hear all frequencies equally well. It is more sensitive to higher than lower frequencies. This means that people may assign different "loudness" to two sounds having identical intensities (volumes) but widely differing frequencies. To compensate for this tendency, various adaptations of the basic decibel scale have been devised to approximate the sensitivity of the ear. The most commonly used adaptations are the EPNdB, which is used to measure aircraft noise, and the A-weighted scale (dBA) which is used in measuring most other noises.

TABLE I. TYPICAL NOISE LEVELS



(iii) Duration is measurement of sound with respect to the frequency of its occurence. Sounds differ in their temporal patterns. A sound may be short or long-lasting; it may be steady, repetitive, or intermittent; and it may occur during the busy day or the quietness of night time. The most noticeable feature of urban noise is that is is rarely steady, but constantly fluctuates as individual noise events occur. Because of this fluctuation, some kind of aggregate measure is necessary to make the evaluation and comparison of noise levels practical. A few of the most common ones are described below (all of these are expressed in terms of the basic unit of dBA):

a. Percentile measurements, Ln, indicates the sound level which is exceeded for a stated percentage of time under consideration (the percentage of time is indicated by the n value, for example, L_{10}). Such percentile measurements are relatively easy to calculate. However, they seem to be better adapted to relatively steady noise situations like freeways rather than airports or rapid transit lines which are characterized by widely separated individual noise events.

b. Community Noise Equivalent Noise Level, CNEL, is a measure of the average sound levels for a 24-hour period which is weighted to assign greater importance to sound occurring during the evening (7:00 p.m. to 10:00 p.m.) and even greater importance to sound during the night period (10:00 p.m. to 7:00 a.m.). This weighting is justified on the basis that noise during these periods is more disturbing than daytime sounds. This system is especially well adapted for assessment of airport noise, however, it is difficult and time consuming to measure.

c. Day/Night Average Sound Level, L_{dn}, is essentially the same as CNEL except that there is only a penalty for sounds occurring during the night. This makes it somewhat easier to calculate. The Federal Environmental Protection Agency has recently recommended that L_{dn} be used, along with a 24-hour L_{eq} measure, as a nation-wide standard for evaluating community noise.

d. Energy Mean Equivalent Noise Level, L_{eg}, is essentially an average of all sounds occuring during a time period. Its value is that of a steady-state sound which would produce the same energy during that period. As such, it reflects all the loud and quiet sounds which occur. Unfortunately, it is fairly difficult to calculate.

(iv) Distance from the source. Noise levels lessen as one moves further from the source.

2. The Effects of Noise on People

In recent years it has been recognized more and more that excessive noise levels can have adverse effects on people, both in terms of their physical and mental health, and also the enjoyment of their environment and the pursuit of work and leisure activities. Some of these effects are difficult to measure, in part because individuals vary so widely in their sensitivity to noise. Nonetheless, these effects are very real—and very significant. The following is a discussion of some of the possible effects of excessive noise.

(i) Hearing Loss. Excessive noise can lead to a permanent deterioration in hearing ability which cannot be offset either through surgery or with hearing aids. Although hearing loss normally occurs only after prolonged exposure to intensive noise, more limited exposure to extremely loud sounds has been known to cause permanent damage.

(ii) Stress Effects. Excessive noise, especially above the level of 80 or 85 dBA, triggers a remarkable number of automatic physiological changes in the body. Usually these stress reactions are only temporary, but as high noise levels become common, some of these effects may become chronic.

(iii) Sleep Disturbance. Obviously noise can interfere with sleep, and lead to fatigue, but sometimes in ways of which a sleeper is unaware. A sound which is insufficient to wake someone may still impair the quality of sleep.

(iv) Interference with Conversation. The intelligibility of conversation begins to be impaired, at any but close distances, whenever the background noise level exceeds 50 to 60 dBA. Serious interference in turn can lead to such things as decreased enjoyment of such activities as television watching and relaxed outdoor patio conversation.

(v) Annoyance Effects. Noise can distract or interfere with one's conversation and even tend to make people nervous and irritable.

With the passage of the Noise Control Act of 1972, the Federal Government has taken the lead in recognizing the potential hazard of excessive noises. This Act authorized the Environmental Protection Agency (EPA) to undertake research on the effects of noise in order to establish Federal noise emission standards for certain products. Research by EPA indicates that excessive noise, depending upon its volume, duration, time of occurrence and other characteristics, can be a nuisance, a health hazard and/or a source of tension (Public Health and Welfare Criteria for Noise).

The document entitled Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety, published by EPA, establishes recommended levels of noise for various environmental situations. Although this document, commonly referred to as the Levels Document, does not itself establish noise level standards, it has been used as a basis in establishing such standards by other Federal government agencies, local jurisdictions and others concerned with noise control and abatement.

Table 2 is a summary of the findings of EPA in terms of acceptable outdoor and indoor noise levels. As indicated by the table, a L_{dn} noise level of 55 dB is identified as the maximum level requisite to protect public health and welfare in the outdoor environment and a L_{dn} level of 45 dB as the maximum level in indoor residential areas. A daily noise level of 70 dB sustained over a period of 40 years would result in hearing loss.

TABLE 2

SUMMARY OF NOISE LEVELS IDENTIFIED AS REQUISITE TO PROTECT PUBLIC HEALTH AND WELFARE WITH AN ADEQUATE MARGIN OF SAFETY
(Source: EPA "Levels Document")

EFFECT	LEVEL	AREA
Hearing Loss	$L_{eq\ (24)} \leqslant 70$ dB	All areas
Outdoor activity interference and annoyance	$L_{dn} \leqslant 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq\ (24)} \leqslant 55$ dB	Outdoor areas where people spend limited amounts of time, ssuch as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{dn} \leqslant 45$ dB	Indoor residential areas
	$L_{eq(24)} \leqslant 45$ dB	Other indoor areas with human activities such as schools, etc.

Explanation of Table 2:

1. The hearing loss level identified here represents annual averages of the daily level over a period of forty years. (These are energy averages, not to be confused with arithmetic averages.)

2. Relationship of an $L_{eq(24)}$ of 70 dB to higher exposure levels.

EPA has determined that for purposes of hearing conservation alone, a level which is protective of that segment of the population at or below the 96th percentile will protect virtually the entire population. This level has been calculated to be an L_{eq} of 70 dB over a 24-hour day.

Given this quantity, it is possible to calculate levels which, when averaged over given durations shorter than 24 hours, result in equivalent amounts of energy. For example, the energy contained in an 8-hour exposure to 75 dB is equivalent to the energy contained in a 24-hour exposure to 70 dB. For practical purposes, the former exposure is only equivalent to the latter when the average level of the remaining 16 hours per day is negligible (i.e., no more than about 60 dB* for this case).

Since 8 hours is the typical daily work period, an $L_{eq(8)}$ of 75 is considered an appropriate level for this particular duration. In addition, the 24-hour exposure level was derived from data on 8-hour daily exposures over a 40-year working life. In planning community noise abatement activities, local governments should bear in mind the special needs of those residents who experience levels higher than $L_{eq(8)}$ at 70 on their jobs.

*This is not to imply that 60 dB is a negligible exposure level in terms of health and welfare considerations, but rather that levels of 60 dB make a negligible contribution to the energy average of L_{eq} = 70 dB when an 8-hour exposure of 75 dB is included.

The levels identified in the Levels Document have been based on the "most sensitive part of the population" with an "adequate margin of safety." They should be viewed as ultimate, not current, desirable goals. It is intended that these levels be utilized as a starting point for assessment of the noise environment. Specific local situations, attitudes and conditions concerning the environment may well result in noise levels that are considered acceptable by residents although higher or lower than those shown.

3. Noise Level Standards for Land Use

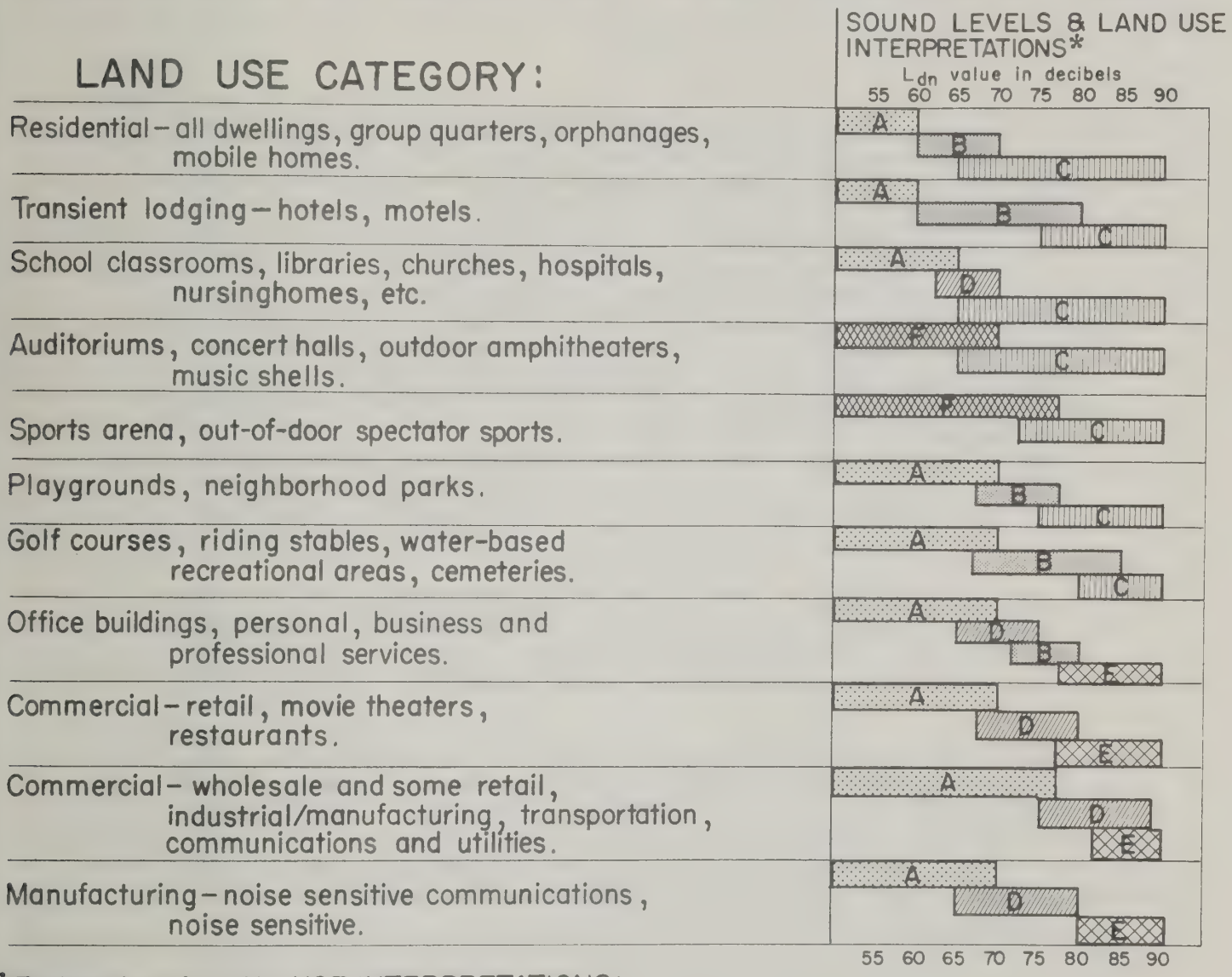
In recognition of the potential adverse effects of noise, many governmental agencies have developed noise standards which related different kinds of land use to maximum acceptable noise levels. These standards are based on the "noise tolerance" of each kind of land use. Obviously a residential area, where activities like sleep and relaxation are basic, can tolerate much less noise than a heavy industrial district where fairly high sound levels are accepted as a normal part of the work environment.

The following table has been developed by Bolt, Beranek and Newman. It is based upon their substantial work in the field of acoustics and was developed to serve as a general guideline for determining appropriate noise levels for various land use activities. The overlapping of acceptable sound levels for various land uses reflects noise reduction measures which may be incorporated into the building design. Guidelines such as these can be used in reviewing projects for noise impacts in relationship to existing and projected land uses and in determining the necessity for noise control and protection measures.

B. Present and Projected Noise Contours

Transportation noises are by far the most common sources of environmental noise. In particular, the most significant contributors are the automobile and the diesel truck. Trucks account for the highest single noise levels, but automobile traffic is by far the most constant source. On the average, trucks are 10 to 15 dBA louder than automobiles. Unlike automobiles, their noise levels depend primarily on the road grade, road condition and acceleration rather than speed.

TABLE 3. LAND USE COMPATIBILITY CHART for COMMUNITY NOISE



*Explanation of LAND USE INTERPRETATIONS:

A. Satisfactory, with no special noise insulation requirements for new construction.

B. New construction should generally be avoided except as possible infill of already developed areas. In such cases, a detailed analysis of noise reduction requirements should be made, and needed noise insulation features should be included in building design.

C. New construction should not be undertaken.

D. New construction should not be undertaken unless a detailed analysis of noise reduction requirements is made and needed noise insulation features included in the design.

E. New development should generally be discouraged. Conventional construction will generally be inadequate and special noise insulation features must be included. A detailed analysis of noise reduction requirements should be made and needed noise insulation features included in construction.

F. A detailed analysis of the noise environment, considering noise from all urban and transportation noises should be made and needed noise insulation features and/or special requirements for the sound reinforcement systems should be included in the basic design.

In Richmond, most of the major transportation facilities are concentrated along a transportation corridor. This corridor starts in the southern portion of the Richmond Planning Area, and generally proceeds in a northerly direction. It is comprised of the Southern Pacific Railroad, the Atchison-Topeka and Santa Fe Railroad, Interstate I-80, Hoffman Freeway and BART. The vehicular routes connect Richmond to Marin County to the west via the Hoffman Freeway and to areas north and south via Interstate 80. The railroad lines crisscross Richmond, with the Southern Pacific (SP) running north to Martinez and Napa County and the Atchison-Topeka and Santa Fe paralleling the SP northward to Martinez before curving south to Los Angeles. BART parallels a portion of the Ohio line of the Santa Fe Railroad and terminates adjacent to downtown Richmond.

Map 1 indicates the transportation facilities in the Richmond Planning Area for which noise contours have been developed. Contours for these facilities are based on most recent estimates of existing usage and usage estimated for 1995.

The noise contours identify areas throughout the City which are subject to certain noise levels due to transportation facilities. These contours are generalized estimates. They are intended only for general planning and administrative purposes, and are not precise levels at particular sites. Further, it should be recognized that transportation facilities are not the only noise sources in Richmond. Noises from all sources, including construction equipment, industrial activity, barking dogs, playing children, lawn mowers and all other activities create a background, or ambient, noise level that may differ in various areas throughout the City. Certain noises, such as the passing of an occasional truck or a freight train, may be heard above this ambient level; while others, such as the steady drone of a stream of cars, may not be distinguishable from all the other noises in a given environment.

Noise levels have generally been increasing, and may keep on doing so under present trends. Increasing traffic, increasing use of noise-producing machinery, and (in some areas) the development of formerly vacant land have contributed to this.

MAP 1.
TRANSPORTATION FACILITIES FOR WHICH NOISE CONTOURS HAVE BEEN DEVELOPED.

RICHMOND NOISE ELEMENT 1975

A discussion of existing and projected noise levels and a map of noise contours for each of the facilities identified in Map 1 follows:

1. Major Arterials

   a. Map 2 indicates the noise contours for major arterials within the Richmond Planning Area based on current traffic volumes. Map 3 indicates contours for these arterials based on traffic volumes projected for 1995.

   b. Fairly high noise levels can be found immediately along all major arterials in the Planning Area with the actual levels generally varying according to traffic volume, speed and the proportion of truck traffic.

   c. Arterials with a heavy load of truck traffic (estimated at 15%)--Carlson Boulevard, Garrard and Pennsylvania Avenues, Hoffman Boulevard and Cutting Boulevard, Castro Avenue--have much higher noise levels as compared to streets carrying a comparable number of vehicles but less truck traffic. This reflects the high noise emission from trucks.

   d. The construction of the new Hoffman Freeway will result in a decrease in projected noise levels, as indicated in Map 3.

   e. The noise contours for 1995 are significantly spread outwards from current contours, indicating higher noise levels.

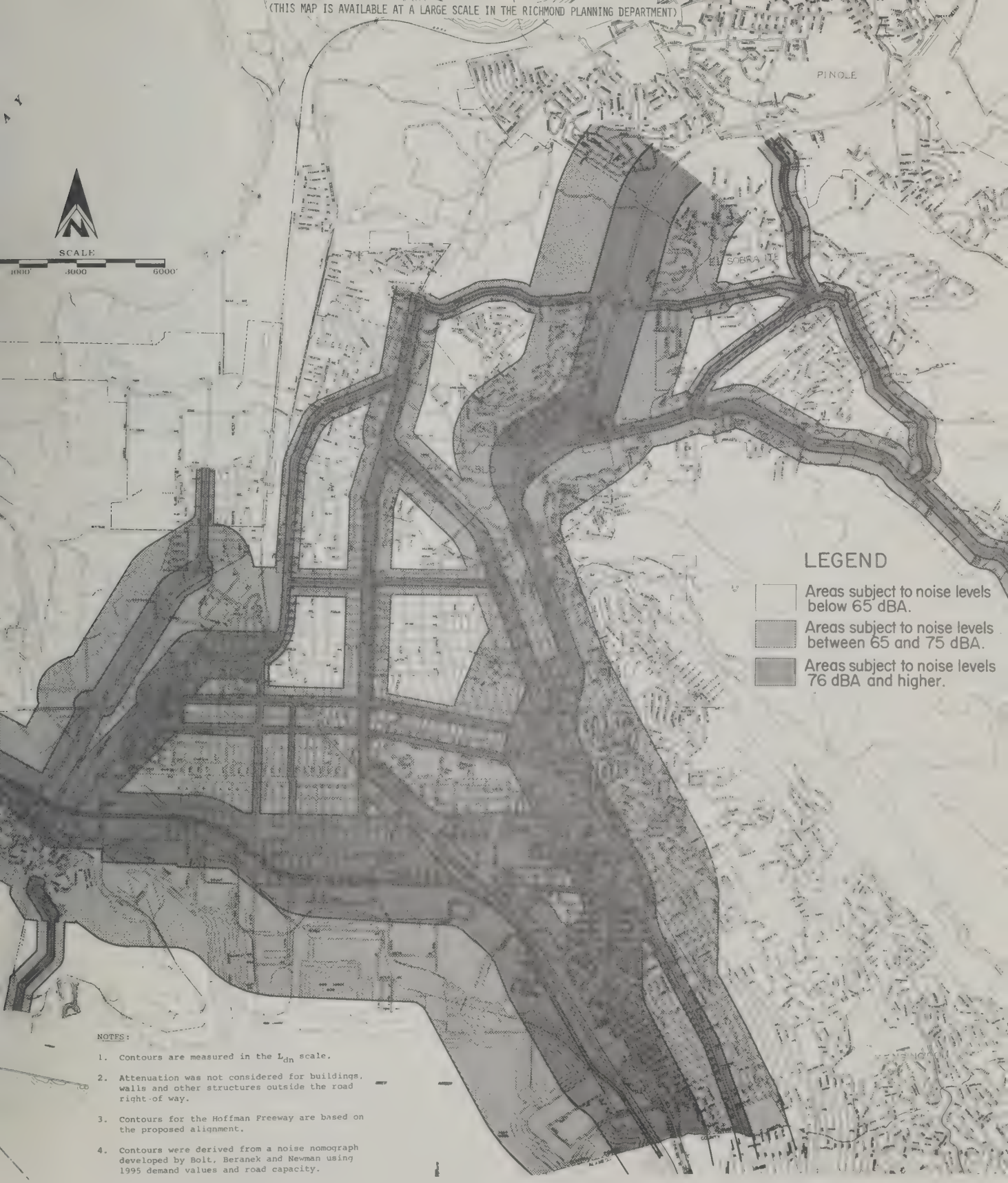
2. BART (Bay Area Rapid Transit District)

   a. Map 4 indicates the existing noise contours for the BART system within the Richmond Planning Area. Map 5 indicates the contours projected to 1995.

   b. The loudest existing noise impact from the BART facilities is limited to the frontages on either side of its right-of-way.

MAP 2.
EXISTING NOISE CONTOURS and IMPACT AREAS for MAJOR ARTERIALS - 1974

RICHMOND NOISE ELEMENT 1975



MAP 3.
PROJECTED NOISE CONTOURS and IMPACT AREAS for MAJOR ARTERIALS - 1995

RICHMOND NOISE ELEMENT 1975

(THIS MAP IS AVAILABLE AT A LARGE SCALE IN THE RICHMOND PLANNING DEPARTMENT)

MAP 4.
EXISTING NOISE CONTOURS for BART - 1974

RICHMOND NOISE ELEMENT 1975

(THIS MAP IS AVAILABLE AT A LARGE SCALE IN THE RICHMOND PLANNING DEPARTMENT)

MAP 5.
PROJECTED NOISE CONTOURS for BART - 1995

RICHMOND NOISE ELEMENT 1975

c. The noise levels projected for 1995 are significantly higher than the existing levels. In some areas there is almost a doubling of the sound level, especially in the areas immediately adjacent either side of the right-of-way and the storage area. In general, not only will the sound levels be higher in the future, but a larger area on either side of BART's right-of-way will be impacted. These higher levels are due largely to an extension of BART's service into the night and more frequent service.

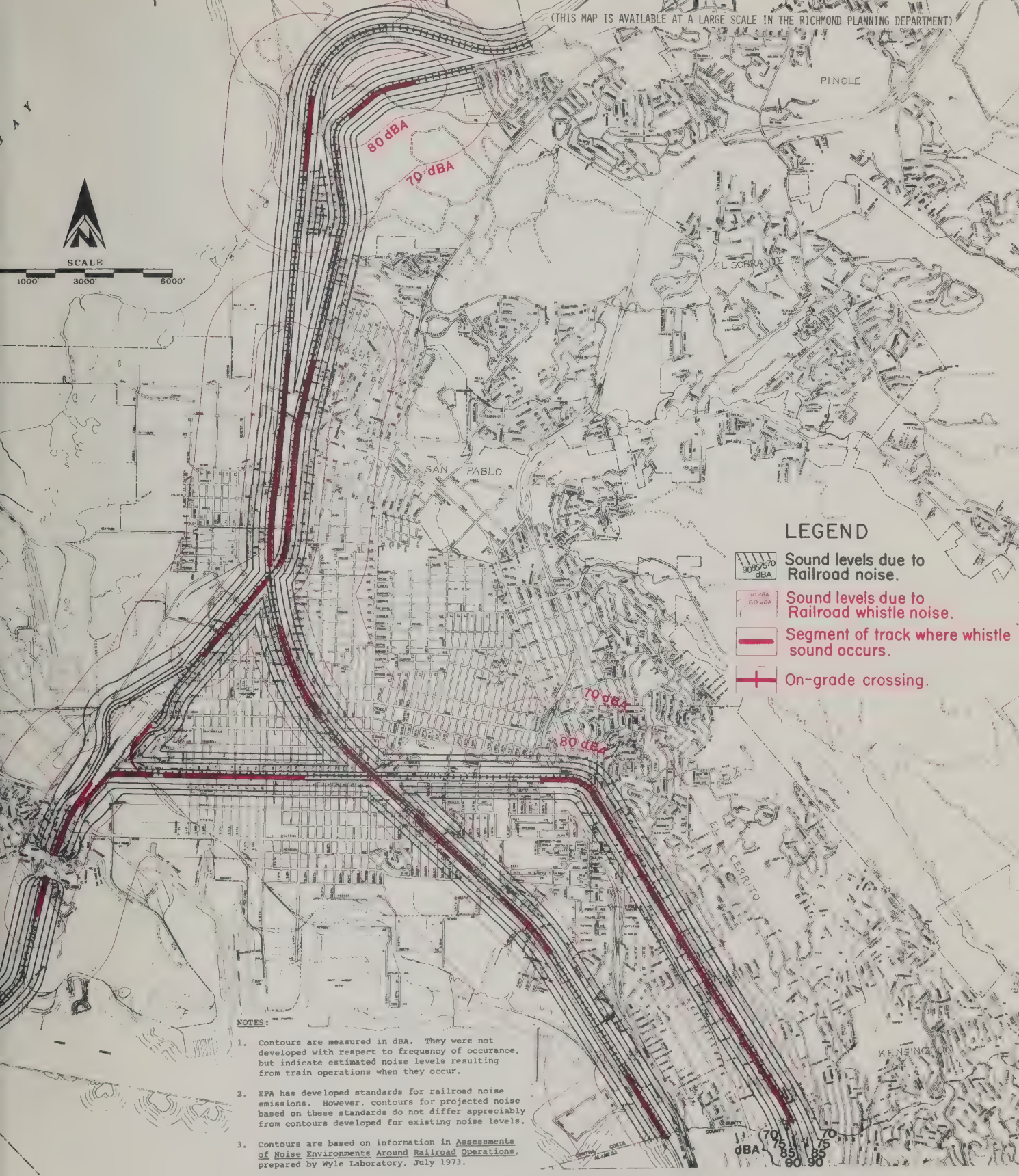
3. Railroad Operations

a. Map 6 indicates estimated existing and projected noise contours for railroad operations within the Richmond Planning Area.

b. The entire central portion of Richmond is criss-crossed by railroad operations. Railroad noise impacts are mainly due to two kinds of operations: mainline movements and yard operations.

c. Recent Southern Pacific mainline operations have consisted of approximately 20 freight daily trains in each direction. Southern Pacific also presently operates a 70 oil car unit train from Utah to the Standard Oil refinery on the average of 3 times weekly. Recent mainline operations of the Santa Fe have consisted of approximately 10 trains arriving and 8 trains departing from the AT & SF yard every 24-hours.

d. The main noise from the Santa Fe in Richmond results not from its mainline operations but from its large switching yard operation west of Garrard Boulevard. The Santa Fe switches to industries north of the yard once a day, to the harbor area twice every 24-hours, and to the industries in El Cerrito, Albany, Berkeley, Emeryville and Oakland at night. In addition, cars are moved to and from the barge dock at Point Richmond continually throughout the day and night.



NOTES:

1. Contours are measured in dBA. They were not developed with respect to frequency of occurance, but indicate estimated noise levels resulting from train operations when they occur.
2. EPA has developed standards for railroad noise emissions. However, contours for projected noise based on these standards do not differ appreciably from contours developed for existing noise levels.
3. Contours are based on information in Assessments of Noise Environments Around Railroad Operations, prepared by Wyle Laboratory, July 1973.

MAP 6.
EXISTING and PROJECTED NOISE CONTOURS for RAILROAD OPERATIONS - 1974 and 1995

RICHMOND NOISE ELEMENT 1975

e. Line operations are characterized by the passage of trains at wide time intervals but with individual trains generating a quite high sound level. The noise level from the cars (though not the locomotives) tends to increase quite significantly with speed. Wheel condition and track alignment, grade and condition are also significant factors. Empirical measures of some railroad line operation noise variables are listed below:

Variable	Related Noise Change* Level (dBA)
Speed	6 (per each doubling of speed)
Rails, jointed vs. welded	4-8
Grade Crossings	6-8
Wheel Irregularities	up to 15
Bridgework:	
Light Steel	up to 30
Heavy Steel	up to 15
Concrete	up to 12
Short Radius Curves:	
Less than 600'	15-25
600 to 900'	5-15

f. Yard or terminal operations are a composite of many switching, classification, and/or maintenance activities. Noises range from the screeching sounds of car retarders to the constant low rumble of idling locomotives.

g. Both the Southern Pacific and the Santa Fe have a significant number of grade crossings which require the use of various signal and warning devices for public protection.

h. Noise impacts from railroad operations are significant and do affect to a large degree several residential areas in Richmond, including Parchester, Point Richmond, Atchison Village, Pullman Plaza and Eastshore.

*SOURCE: Whyle Labs, Assessment of Noise Environments around Railroad Operations, Associates of American Railroads, July, 1973, p. 3-8.

i. The United States Environmental Protection Agency has developed railroad noise emission standards for locomotive and railroad car noise. These standards, which have not yet been adopted, will not significantly lower locomotive and car noise levels, and make no provisions for noise from other railroad operations, such as repair and maintenance shops, terminals or yards, horns, whistles, bells or other warning devices.

4. Aircraft Operations

a. Aircraft operations in the Richmond Planning Area consist of three heliports that have been developed in the coastline area:

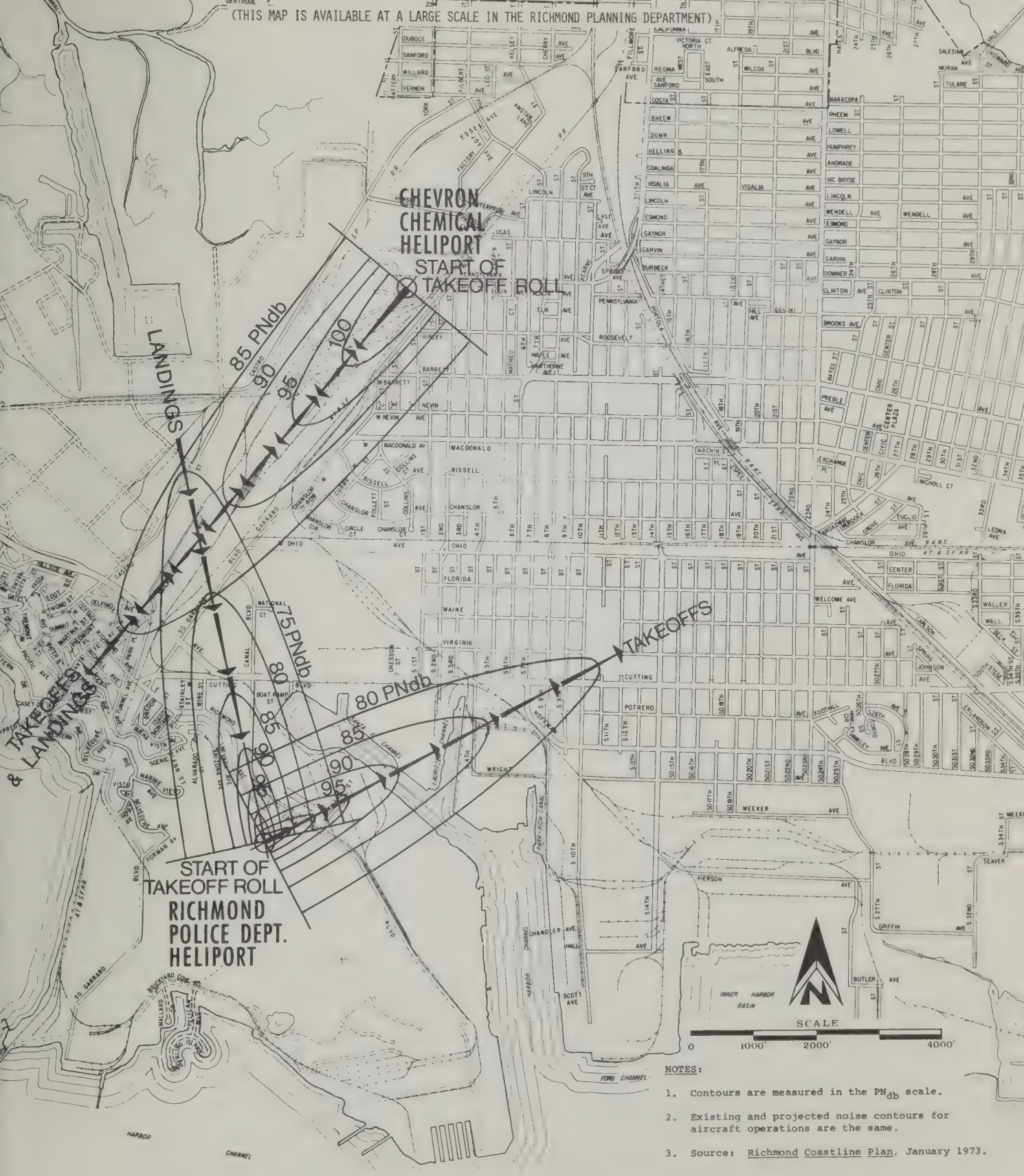
— The Richmond Police Department heliport next to the Point Richmond Sewage Treatment Plant. This heliport is used every other day for routine operations (the Department also operates a small plane out of an airport in Concord which it uses on alternate days) and daily for emergency operations.

— The Chevron Chemical heliport west of Garrard Boulevard near First Street. This heliport is used occasionally, about 4-6 times a year.

— The University of California Field Station heliport at 45th Street. This heliport is seldom used, about once or twice a year, and may be phased out in the future.

b. Map 7 indicates existing and projected noise contours for the Police Department and Chevron heliports. (The University of California's heliport is not included because it is used so infrequently).

c. Much of the area affected by high noise levels generated by the heliports is industrial. However, the residential areas of Point Richmond, Atchison Village and a portion of the Coronado neighborhood are within the noise impacted area. Washington School, in Point Richmond, is directly under the landing path of the Police Department heliport.



NOTES:

1. Contours are measured in the PN_{db} scale.
2. Existing and projected noise contours for aircraft operations are the same.
3. Source: Richmond Coastline Plan, January 1973.

MAP 7.
EXISTING and PROJECTED NOISE CONTOURS for AIRCRAFT OPERATIONS - 1974 and 1995

RICHMOND NOISE ELEMENT 1975

C. Identification of Noise Impacted Areas

1. Residential Areas Subject to Excessive Noise Levels[1]

Certain residential areas in the Richmond Planning Area are subject to transportation noise levels in excess of 65 dB. This noise level is high enough to interferewith outdoor activities and with indoor activities as well, if windows are left open. The most seriously noise impacted residential areas are:

- Richmond Annex
- Eastshore
- Pullman Plaza
- Southside
- Iron Triangle
- Point Richmond

In addition, all the property near the major thoroughfares, particularly those routes with high amounts of truck traffic and Interstate 80, are subject to high exterior noise levels.

2. Noise Impacts on Specific Land Uses

Some land uses are particularly sensitive to noise. In addition to residential areas, these include hospitals and convalescent homes, outdoor recreational areas and schools.

a. Hospitals and Convalescent Homes. All the hospitals and convalescent homes are located near major thoroughfares and thus are subject to high exterior noise levels.

b. Outdoor Recreational Areas. The two largest outdoor recreational areas, Alvarado Park and Wildcat Regional Park, are located away from the high traffic noise sources. However, a majority of the other major outdoor recreational facilities, including Eastshore Park, John F. Kennedy Park, Nicholl Park and Martin L. King Park, are located in areas subject to high transportation noises.

[1] Railroad and aircraft operations are excluded from consideration because the noise contours for those facilities were developed from a different scle than the other transportation facilities.

MAP 8.
AREAS SUBJECT TO EXCESSIVE TRANSPORTATION NOISE LEVELS

RICHMOND NOISE ELEMENT 1975

c. Schools. A significant number of schools are located near major thoroughfares and thus are subject to high exterior noise levels. Schools subject to high exterior noise levels are Washington, Peres, Coronado, Nystrom, Riverside, Madison, Sheldon, Murphy, Kennedy High School, Richmond High School and DeAnza High School.

Map 8 indicates residential areas subject to noise levels in excess of 65 dB from transportation facilities. (Note: Map 8 is not based on actual noise measurements, but is a straight line projection of the theoretical extent of noise. For any given property, an on-the-spot noise measurement may be much different due to shielding effects). The location of hospitals, convalescent homes, major outdoor recreational areas and schools that are subject to high levels is also indicated.

III. POLICIES

The following policies were developed to achieve the overall goal of reducing obtrusive transportation noises and minimizing, where it is feasible to do so, unpleasant and excessive noise impacts. It must be recognized, however, that the City is constrained in its actions to reduce transportation noises by several significant factors. First, Federal and State governments have established regulations for vehicular and most train emission noises which pre-empt local jurisdiction and control. Second, in most of the Richmond Planning Area, major transportation and land use patterns have already been firmly established. These patterns subject residential and other noise sensitive areas to high noise levels because of their proximity to heavily travelled transportation routes. However, there are some noise mitigation actions the City can take regarding land use and transportation issues.

Goal I: Reduce Transportation-Related Noise

Policy 1. Support efforts of the California Department of Transportation (CalTrans) to institute noise reduction measures on existing freeways to lessen noise impacts on areas immediately adjacent to the freeway.

This policy is directed to the present policy of CalTrans to achieve noise levels within practical limitations on existing freeways. CalTrans' immediate concern is focused on residential areas adjacent to existing freeways which are exposed to traffic noise in excess of the Federal Design Levels of L_{10} 70 dBA. The first priority is residential areas which existed prior to the route adoption of each freeway. The number of attenuation projects which will be undertaken will depend upon the funding level of this particular program.

Policy 2. Urge strict enforcement of the Federal railroad noise emission standards by the U. S. Department of Transportation when they become effective.

Federal noise emission standards are being developed by the Environmental Protection Agency and will regulate locomotive and railroad car noises.

Policy 3: Investigate measures that can be undertaken by the railroad companies to lessen noise emissions, such as the use of welded track, reduction of speed near residential areas, abandonment of lightly used rights-of-way and construction of grade-separated crossings.

Policy 4: Investigate the feasibility of enforcing the California Vehicle Code noise emission standards for vehicles operating on City streets.

The California Vehicle Code has established noise emission standards for the operation of all licensed motor vehicles in California. These standards are enforced by the California Highway Patrol on freeways and by local police on City thoroughfares. Currently, the Richmond Police Department does not enforce these standards, except in a case of extremely loud mufflers. Enforcement would result in some direct costs to the City, including costs for training and equipment as well as additional manpower. A feasibility study would analyze the additional costs that would be incurred if the standards were enforced and the degree to which the noise level throughout the City would be reduced.

Policy 5: Continue to implement traffic and highway improvements that will lessen noise from or alleviate the need for through traffic, especially truck traffic, passing through residential neighborhoods.

This policy reflects an ongoing policy of the City. Specifically, these improvements include the designation of truck routes, establishment of computerized traffic responsive signal control systems along major thoroughfares, and the development of new road systems such as the Hoffman Freeway and North Richmond Bypass to channel truck traffic away from residential areas. Some of these improvements, such as computerized signal control systems and the development of new road systems, are dependent upon State and Federal funding.

Goal 2: Minimize Noise Generation and Impacts

Policy 6: Require noise contours for "before" and "after" as part of the study made of all projects requiring Environmental Impact Report (EIR) review as a means of developing data over a period of time to establish noise levels throughout the City.

This Noise Element only provides data on noise levels due to transportation facilities for those areas of the City near these facilities. In order to fully evaluate Richmond's noise environment, it is necessary to have information on the ambient, or background, noise levels throughout the City. Although transportation noises contribute greatly to this ambient level, other "fixed-point" noises, such as industrial activity, are also significant. Over a period of time, noise contours required as part of the EIR process could be used to establish noise levels or zones throughout the City.

Policy 7: Discourage development, when noise levels are established, where such development will significantly increase existing noise levels, unless mitigation measures are designed as part of the project to limit noise emissions to an acceptable level compared to the existing sound level.

This policy is directed at maintaining the existing noise levels throughout the City (when there is sufficient data documenting these levels) and protecting residents from sudden increases in their noise environment because of a large project.

Policy 8: Require the use of acoustical materials and construction on new residential development adjacent to freeways to minimize noise intrusion from heavy vehicular traffic.

Noise levels adjacent to the freeways are excessively high. If there is pressure for residential development there anyway, developers should be required to protect future occupants from this excessive noise.

Policy 9: Develop criteria establishing proper site planning and building orientation that will lessen noise intrusion and minimize noise emissions.

Policy 10: Require City departments and agencies to review their activities to insure that noise from activities such as construction, street sweeping, street maintenance, etc., has been reduced to the lowest possible level. In addition, require City departments and agencies to review specifications for City equipment purchases and specify, if necessary, maximum noise emissions permissible.

Goal 3: Minimize Noise Impacts of New Transportation Facilities

Policy 10: Review and withhold entering into any freeway agreement with CalTrans until the City is satisfied that adequate noise control measures will be provided in the design and construction of any new State highways within the Richmond Planning Area.

Adequate noise control measures would include items such as depressed sections, the use of planting, acoustical walls and other noise control barriers, and route locations in areas or along routes of least sensitive land uses. This is an ongoing policy of the City.

RICHMOND CITY COUNCIL

Gary Fernandez
Mayor
Nathaniel Bates
Vice-Mayor
Fritz Allen
Bob Campbell
Tom Corcoran
Stanley Grydyk
Richard Nelson
A. E. Silva
Don Wagerman

RICHMOND CITY PLANNING COMMISSION

Donald Greco
Chairman
William Allyn
Vice-Chairman
Gary Pitts
Secretary
Zeke Griffin
Robert Harris
Anthony Lobese
Roy Miller
Charles Modie
Michael Vukelich

Kenneth H. Smith, City Manager

CITY PLANNING DEPARTMENT

Charles E. Woodward
Director
Milton J. Nicholas
Assistant Director

Report Preparation
Sandy Ruffin

Graphics
Ron Meux

Typing
Linda Rogers

PUBLIC WORKS DEPARTMENT

Robert S. Latchaw
Director

Technical Advisor
Roy Nakadegawa